Made in USA

Slim Line Rack UPS
User's Manual
Models 3 & 4

MGE
UPS SYSTEMS

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Revision History

Esprit Rack UPS User's Manual
86-153301-03

Revision A00 New Release 10/00

Safety

Important Safety Instructions. Save These Instructions.

This manual contains important safety instructions for the Esprit Models 3 and 4 that should be followed during installation and maintenance of the UPS and Batteries.

Caution: Risk of electric shock, even with the unit disconnected from the AC power source. Hazardous voltages still may be present through operation from the battery. The battery supply should be disconnected by unplugging the battery cord from the UPS when maintenance or service work inside the UPS is necessary.

The UPS and battery module contains voltages which are potentially hazardous. All repairs should be performed by qualified service personnel only.

- Do not attempt to power the UPS from any receptacle other than a 2-pole, 3-wire grounded receptacle for models 3 and 4.
- To reduce the risk of fire, connect Esprit to a circuit provided with the following maximum branch circuit protection in accordance with NEC, ANSI/NFPA70:
  Model 3: 30 ampere branch circuit protection;
  Model 4: 50 ampere branch circuit protection.
- Do not place Esprit near water or in an environment of excessive humidity.
- Do not allow liquids or foreign objects to get inside Esprit.
- Do not block air vents in front, on top, or on bottom of Esprit.
- Do not plug any household appliances such as hair dryers into Esprit receptacles.
- Do not place Esprit in direct sunlight or close to heat emitting sources.
- The AC power receptacle should be near the equipment and easily accessible. To isolate Esprit from AC input, remove the input cord from the AC power receptacle.
- Esprit contains lead-acid batteries that should be disposed of or recycled in accordance with local applicable laws.
- Prior to installation, store Esprit in a dry location.
- Storage temperatures must be between -4° to +113°F (-20° to +45°C);
- Servicing of batteries should be performed or supervised by personnel knowledgeable of batteries and the required precautions to handle high voltages. Keep unauthorized personnel away from batteries.
- When replacing batteries, use the same number and type of batteries:
  12 each, 12V - 5 Ahr.
  - For model 3, use MGE P/N: 031-000003-0000
  - For model 4, use MGE P/N: 031-000004-0000

~ : alternating current supply symbol

— : direct current supply symbol

⚠ : risk of electric shock symbol

Caution: Do not dispose of batteries in a fire. The batteries may explode. Do not open or mutilate the batteries. Released electrolyte is harmful to the skin and eyes. It may be toxic. A battery can present a risk of electric shock and high short circuit current.

The following precautions should be observed when working with batteries:

- Remove watches, rings, or other metal objects.
- Use tools with insulated handles.
- Do not lay tools or metal parts on top of batteries.
- Disconnect the charging power source prior to connecting or disconnecting battery terminals.
- Wear rubber gloves, boots, and safety glasses.
- Determine if the battery is inadvertently grounded.
- Please dispose of the packaging in accordance with applicable laws.

Federal Communication Commission (FCC) Statement

Note: This equipment has been tested and found to comply with Class A limits of Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when equipment is operated in an industrial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits.

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1. Introduction

Thank you for your purchase of the Esprit rack "UPS" from MGE. The Esprit "UPS" will provide many years of, trouble-free power protection for critical high availability servers and other devices. Please read this manual fully, to familiarize yourself with the safety instructions and Esprit features.

MGE UPS Systems

MGE, one of the largest UPS manufacturers in the world, has a power protection solution for every power problem. Our product range includes UPSs from 250 VA to over 4.5 MVA in single and three phase configurations. Other products include Power Management Software, DC to AC inverters, line conditioners and isolation transformers. Contact your sales representative today for additional information about MGE's other fine products.

Why the Need for Uninterruptible Power?

Servers and other electronic devices do not store sufficient energy to overcome the power outages and short interruptions that occur on a daily basis. Any interruption of the utility power may stop the operation of a computer and cause loss of data, potential hardware damage, and inconvenience.

A "UPS" is an uninterruptible power supply. The UPS has an internal battery to provide power back-up if the utility power is lost or a short outage occurs. In addition, the Esprit UPS provides surge protection from indirect lightning strikes, power surges and short high voltage transients (spikes) created by machinery or other common equipment.

Theory of Operation

Esprit normally operates in the bypass mode. Surge suppression and filtering are also provided in this mode.

The UPS instantly transfers the load to the battery when a power failure occurs. If the power returns before the battery is exhausted, the operation returns to normal and the battery is recharged.

The Esprit UPS is comprised of three major systems: the inverter, the battery/battery charger and the bypass.

All logic and supervision in the UPS is provided by a state-of-the-art micro-controller.

Inverter 

The inverter is the heart of the UPS and inverts direct current (DC) from the battery into alternating current (AC) at 120 volts. The DC voltage from the batteries is converted into a pseudo-sine wave by a pulse width modulated (PWM) inverter. This unique MGE technique, eliminates all bulky 60 HZ components, reduces heat, and greatly enhances reliability.

Battery 

The battery provides the energy source for back-up when a power failure occurs. The battery is a recombinant, sealed, lead acid-type battery which provides the high current required for UPS use and long life. It requires no addition of water during its life.

Battery Charger 

The battery charger maintains the battery. The battery charger converts 120 volt AC utility power to filtered and regulated DC current specific for battery charging.

Bypass 

The bypass is the electro-mechanical hardware providing a transfer to or from the inverter. This is done rapidly and synchronized to the utility power sine wave in order to provide continuity to the critical device and not cause a re-boot.

Make Sure You Have the Following:

- Esprit Rack UPS
- Solution Pac CD ROM
- Cables (RS232 & USB)
- Quick Start Guide
- Stabilizing Feet (2)
- Mounting Screws & Nuts
- MGE P3 Policy
- Warranty Card
- Warranty Statement
- Esprit Label
- Rack “ears” (2)

2. Getting to Know Your Esprit Rack UPS

2A. Product Features & Benefits

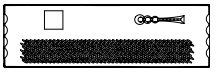
Features	Benefits	Comments
◗ Plug in operation	Low installation cost	
◗ Modular concept	Greater flexibility	Add batteries as needed
◗ High efficiency	Longer life and back-up time	Up to 93% on battery, 98% on utility
◗ 2/3 components reduction	Longer life, higher reliability	Unique MGE design
◗ Many user selectable parameters	Tailor the UPS to environment	Front panel button accessible
◗ Built-in receptacles	Easier to specify	Most common NEMA receptacles are included
◗ Quiet operation	Allows placement in "library type" environments	Small fan only runs while in battery mode
◗ Standard HID communications	Provides the latest and fastest communications possible	Other communications optional
◗ Network-based power management software	Multiple server shutdown and supervision	
◗ Web management via XML	New standard for web management	Easier to use than HTML and provides additional features
◗ Extended distribution options	Provides additional receptacles for critical loads	Optional Call factory for availability

2B. UPS Model and Battery Identification

(US and Canadian Models)

Dimensions/Weights and Part Numbers

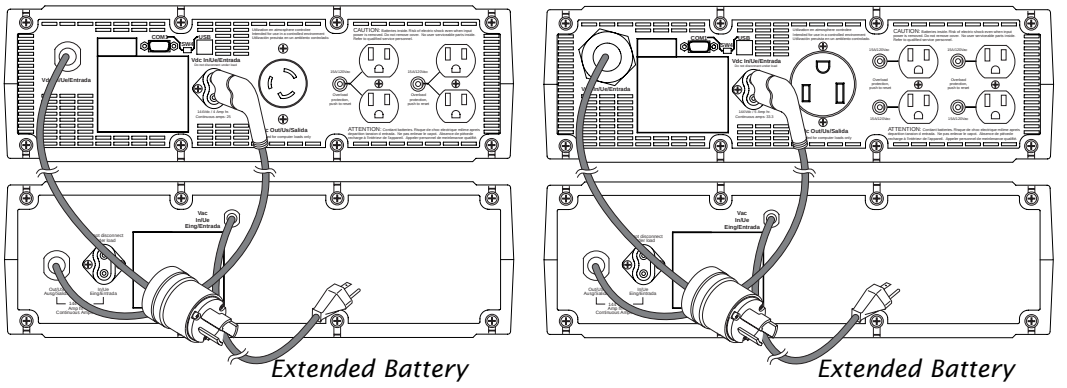
Model	Dimensions (H W D)	Weight (lbs.)	Part Number	UPC
Esprit 3 SLR	5.25 x 17 x 20	75	ESP030	635760894318
Esprit 4 SLR	5.25 x 17 x 20	75	ESP040	635760894455
SLR Extended Battery	5.25 x 17 x 20	60	ESP001	635760894004
Rack rail kit	5 x 5 x 17	6	ESP104	635760894042
AS/400 DB9 cable	12 x 12 x 1	1	ESP105	635760894059
AS/400 DB15 cable	12 x 12 x 1	1	ESP107	635760894073



2C. Esprit Rack UPS Product Views With Rack Kit

Figure 2a. Rear View of Models 3 and 4 With Rack Kit and Extended Batteries

Model 3 *Model 4*



Extended Battery *Extended Battery*

Figure 2b. Optional Rack Mounting Kit (ESP104)

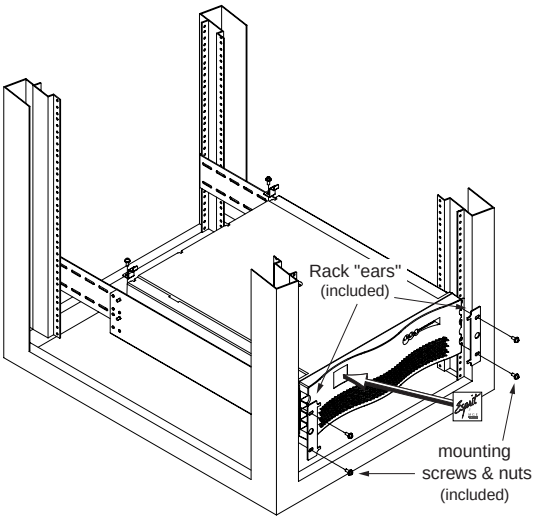
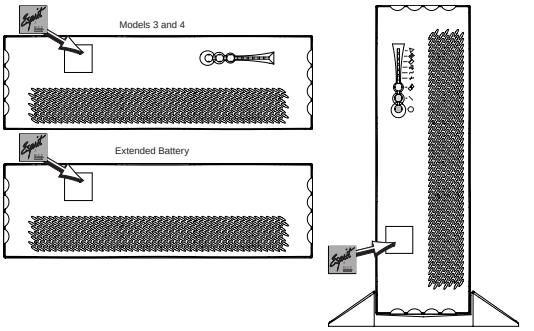


Figure 2c. Typical Front Views of Models 3, 4, Extended Battery, Label Placement



3. Installation

3A. Storing the UPS and Recharging the Battery

Always store the equipment in its original packaging.

The battery is of the sealed lead-acid type. Battery recharge requires that the battery module be plugged into an energized NEMA 5-15 receptacle for 6-8 hours. The battery may be charged in the box by pulling the AC cord out through the bottom.

Battery storage or prolonged shutdown should never exceed 6 months or 68°F (20°C), for a battery initially at 100% charge. The battery warranty is void if the 6 month recharge interval is not adhered to.

3B. Unpacking the UPS

It is recommended that the equipment be unpacked in an area close to its installation location.

Caution: The UPS and extended batteries weigh up to 75 pounds each. Two people are required to lift the unit.

Remove the Solution-Pac CD, RS232 cable, and USB cable from the box and set aside for later use. Fold the box flaps outward. Gently rotate the box on its side and slide the unit out of the box. Gently rotate the unit upright and then remove the packing material. Save packaging for future shipment of UPS to MGE for recycling.

3C. Placement of the UPS

Choose a location out of direct sunlight with adequate ventilation. The operating ambient temperature range is 32° to 104°F (0° to 40°C). Temperatures above 77°F (25°C) should be avoided as battery life is reduced.

Ensure that there is clearance around the intake vents in the front of the UPS and that the rear is unobstructed. Six inches of clearance at the rear of the unit is required. Units may be placed vertically or horizontally with zero clearance. Use the supplied stabilizing feet when vertically mounting the UPS and/or extended battery.

Rack Mounting

Optional rack mounting hardware is available for rack mounting. Instructions for their use are included in the rack kit. See ***Figure 2a***.

3D. Optional Accessories

The following accessories are available for use with your equipment. Refer to each accessories' manual for full installation, operation and maintenance instructions.

- Rack Rail Kit
- Multi-slot Communication Cabinet
- Extended batteries (no additional manual necessary)
- AS/400 Cables (for contacts)
- Extended distribution

3E. Connecting the Optional Extended Battery

Plug the DC battery cable into the UPS module as shown in ***Figure 2a***. The cable plug is keyed, so make sure to align the plug properly to the receptacle. Do not force the cable on, nor attempt to reverse the connection. To do so, will damage the equipment and void the warranty. Plug the AC line cord into an AC line receptacle. ***See Figure 3f***.

3F. Disconnecting the UPS & Battery to Take Out of Service

Turn off the UPS module by depressing the “Off” red button if the “inverter on” or "utility power present" (bottom LED) is lit. Unplug the AC line cord for the battery module. Unplug the DC battery cord. For extended batteries unplug AC line cord and DC battery cord.

3G. Connecting to the Communication Ports

If you plan to utilize Solution-Pac HID ("human interface device" protocol), read the Solution-Pac HID manual on the Solution-Pac CD for a full description of its features.

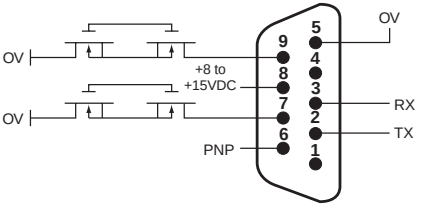
To connect to your computer, you will need the RS232 serial port or a USB (Universal Serial Bus) port. The connection will be made between your computer’s serial or USB port and the serial or USB port on the rear of the UPS module as shown in ***Figure 3d***. Cables are supplied for this purpose.

A slide switch is provided for either RS232 or USB communication. The slide switch (shown in ***Figure 3d***) is preset for RS232. Push the switch down for USB communication.

If communication does not operate, check the position of the slide switch.

The RS232 port also contains two low voltage (24 VDC)/low current (5MA) contact closures. See ***Figure 3d*** below. To use these an optional cable is available. These can be used by AS/400 computers or for special uses.

Figure 3a. RS232, Contact Closures and Remote Shutdown



1. Open
2. RTXD transmit (TX)
3. RRXD receive (RX)
4. OPEN
5. LOGIC RETURN (OV)
6. PNP (plug and play, do not use)
7. ALARM - Contact closure through a transistor from pin 7 to pin 5 when "low battery".
8. RPO - A logic high will activate an output shutdown.
9. INVO - Contact closure through a transistor from pin 9 to pin 5 when the unit is on Inverter.

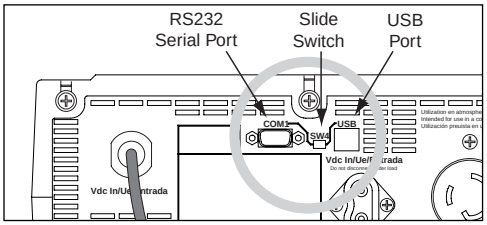
The transistor resistance is 27 ohms and the maximum current allowed is 140mA AC or DC with ambient temperature of up to 40°C.

In order to get a "logic low" you have to limit the current to: logic low voltage required divided by 27, logic low voltage = 0.5V. I max = 0.5/27=0.0185A=18mA.

If you intend to use other forms of communication, an optional Multi-slot Communication is available that will convert the RS232 serial commands into the following formats:

- Ethernet, SNMP
- J-Bus/RS422
- High voltage/current relay contacts

Figure 3b. Communication Ports (USB and RS232 serial port)



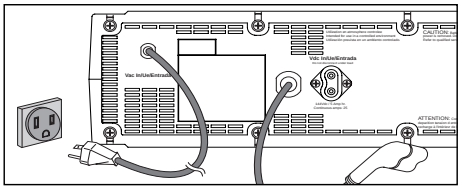
3H. Connecting the UPS to the Utility

Plug the AC line cord of the UPS module into an AC 2-pole, 3-wire grounded receptacle for models 3 and 4. There should be no other loads on this branch circuit. To do so may result in a circuit overload. Refer to National Electrical Code (NEC) specifications for requirements in your area or ask your electrician.

Table 3a. UPS Wiring Information

Model	Plug	Amp rating
3	L5-30	30
4	5-50	50

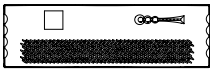
Figure 3c. AC Line Cord of the Extended Battery



3I. Connecting the Loads

Utilize the receptacles on the rear of the UPS module to connect your critical loads. If you need more, you may want to consider the addition of MGE's optional distribution extension.

Caution: Never plug a surge suppressor into the output of a UPS. Most UPSs do not produce the proper output wave shape for surge suppressor use. Improper use and resultant damage is not covered by warranty.



Caution: Connect only computer-type loads to the Esprit UPS. Warranty is void if non-computer-type loads are connected to the UPS.

3J. Solution-Pac Software

Solution Pac software allows you to interface your computer with the UPS. The software is loaded on your computer and through the communication port, can access and react to status information from the UPS. Refer to the Solution Pac manual on the CD for a full description of its operation.

4. Startup and Shutdown

4A. UPS Startup

You are ready to start the equipment after installing the UPS module, optional battery module(s), any options, and the communication cable (if used).

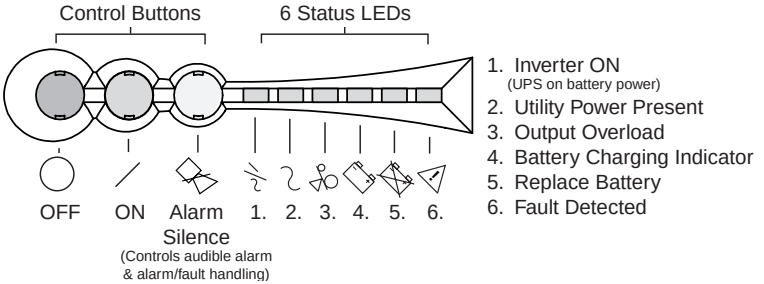
Follow these simple steps:

1. Connect your computer equipment.
2. Depress the green "ON" button. You will hear an audible beep, and the “Utility Power Present” LED "⏦" will be green. See ***Figure 4a.***
3. Turn on any computer equipment.

Your UPS has auto-frequency and voltage sensing and will automatically configure itself to 120, 50 or 60 Hz.

Your equipment is now receiving protected power from the UPS.

Figure 4a. Front Panel Indicators and Controls



LED operation is described fully in section 4E.

4B. Initial Startup Tests and Diagnostics

Your UPS will perform internal diagnostics as well as check utility power.

After depressing the green "On" button and starting your UPS for the first time, you will hear an audible "beep" confirming the button has been depressed, and your UPS will perform the following diagnostic tests:

1. All front-panel LEDs will light, allowing visual confirmation that LEDs function properly.
2. UPS will confirm the integrity of factory calibration settings. FAULT indicator illuminates "⚠" if internal settings have been corrupted.
3. UPS will check utility input frequency and configure itself accordingly. If utility power is not present, the UPS configures itself to run at the last frequency it detected in a previous power-up operation.

If desired, the UPS can be set up to operate at a known, fixed frequency regardless of the detected utility frequency. Fixed-frequency operation is often desirable in installations that make use of cold-start capability. Discussion on this is in the Advanced Configuration Section (section 6) of this manual.

If utility power is present and within specifications, your UPS will start up in bypass mode. Power will be supplied to your computer loads and will be protected from a utility loss. The utility power present, green indicator "⏦", will be lit.

If utility power is not present, your UPS will start on battery until utility power is restored. No diagnostics will be performed in this case.

4C. Battery Operation

Battery Mode: Utility power is outside specifications and computer loads are now powered
⏥ On by UPS battery source.

Bypass Mode: Utility power is present and within specification limits.
⏦ On

Inverter On Mode: Utility power is available but is outside specification limits.
⏥ On
⏦ Flashes

Battery Low: A low battery warning will sound. Acknowledge the alarm by depressing the
⚠ Flashes grey push button. Immediately save your work and shut down connected computer loads to prevent data loss. The actual time to reach "low battery" can vary significantly depending on the critical loads and condition of the batteries.

4D. UPS Shutdown

At any time, your UPS may be shut down by depressing the "Off" red button. Make sure to hold the button down for 2 seconds (prevents accidentally turning off your UPS). You will hear an audible "beep" confirming the button has been depressed.

4E. Front Panel Display Functions

LED Operation

There are six status LEDs, arranged in a vertical column just above the control buttons. Icons to the right of each indicator indicate the function. The status indicated by each LED is listed below, in the order that they appear on the front panel (top to bottom):

		Off	Flashing	On
1.	Fault Detected (yellow) 	The UPS is operating normally. No faults have been detected.	The UPS has detected a new operating fault. The FAULT indicator will continue to flash until the fault has been acknowledged by pressing the grey silence alarm button.	The UPS has detected an operating fault that has been acknowledged by the user.
2.	Replace Battery (red) 	The UPS battery is O.K.		The result of the last battery test indicates that the UPS battery cannot provide at least half of its rated run time. The battery should be replaced. This could also indicate an inverter problem.
3.	Battery Charging Indicator (green) 	The UPS battery is charged within 80% of its full capacity.	The charger is not operating properly. Check that the battery module power cord is plugged into a source other than the UPS itself.	The UPS battery is not yet fully charged and cannot deliver its full rated run time if a power failure occurs.
4.	Output Overload (yellow) 	The UPS is capable of supporting the load connected to it.	The UPS is heavily overloaded. Automatic shutdown is imminent.	The UPS is slightly over-loaded. The UPS will continue to support the load but it may not be able to provide its full rated run time if the UPS has to run on battery power. Reduce the load.
5.	Utility Power Present (green) 	Utility power is not connected to the UPS.	Utility power is present but is either unstable or the line voltage is too high or too low to allow operation in utility power mode. In this state, the UPS will normally be operating on battery power.	Utility power is present, stable and within acceptable voltage limits. In this state, the UPS will be operating on utility power mode.
6.	Inverter on/UPS on battery power (green) 	The UPS is not operating on battery power. The inverter is turned off.	The UPS is operating on battery power and performing its periodic inverter/battery test. The battery test is started once every 28 days of operation and lasts for up to 60 seconds.	The UPS is operating on battery power. The inverter is running.

The "Fault Detected" LED turns on and acts as described above for ANY system alarm, including those that have their own status indicators (e.g. overload, replace battery).

Button Operation

There are 3 buttons present on the front panel:

- The grey, "□" top button controls the audible alarm and alarm/fault handling.
- The green, " | " center button turns the UPS on.
- The red "◯", bottom button turns the UPS off.

The internal microprocessor can directly read the state of the top (alarm silence) and bottom (power off) buttons. The UPS is capable of distinguishing between a “short” and “long” depression and can perform different actions based on how long a button or combination of buttons is depressed. A “short” button press is defined as pressing and releasing a button within a 2-second time frame. A “long” button press is recognized if a button is pressed and held for more than 2 seconds.

When a button is pressed, the UPS responds by beeping the horn. If the button is held down longer than 2 seconds the UPS responds by beeping the horn again. The action assigned to a short button press is carried out AFTER the button is released. Actions assigned to a long button press are carried out immediately after the 2-second timeout, even if the button is not released after this time.

The UPS is capable of decoding six distinct “button states”:

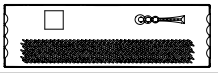
1. **Short Top button press: Silences the alarm beeper** if it is active. If a new alarm/fault is detected after a silence operation, the beeper will be re-activated to issue the new alert. This button sequence can be thought of as an "alarm/fault acknowledge" function. By pressing it, the user acknowledges the presence of the then-active system alarms. After an acknowledge sequence, any new alarms that occur will be brought to the user's attention by re-activating the alert beeper.
2. **Long Top button press:** Clears all active alarms and attempts to **re-start the UPS on utility power**. If the UPS is already operating on utility power, or operating on inverter because utility power is not present or not usable, then the alarms will be cleared but the restart-on-utility request will be ignored. If the condition(s) that caused an alarm persist after alarm(s) are cleared, the UPS will re-issue the alarm after a short delay.
3. **Short Bottom button press: No UPS activity** is associated with this button combination.
4. **Long Bottom button press: Powers down the UPS**. This is the "off switch". When the UPS is powered down, neither utility or inverter power is provided to the load.
5. **Short Top + Bottom button press:** The UPS will **perform a battery test** IF the UPS is running on Utility power, and the battery is at least 80% charged (charger indicator on). If these two conditions are not met, the test will be postponed until they are met.
6. **Long Top + Bottom button press:** The UPS will enter **configuration mode**. In this mode, various operational parameters may be changed by the user. To exit configuration mode, press the top and bottom buttons again.

Although six button states are detectable, not every button combination has an assigned task. button states/combinations that have no assigned task will simply be ignored.

The “Utility Power Present” does NOT reflect the state of the UPS output. If, for example, the UPS has shut down due to an output overload, the Utility Power Present LED may be solidly ON but the UPS output could be turned off (due to the overload).

4F. Fault Alarms

LED Status	Audible Alarm Pattern	UPS Action
Fault "⚠" LED flashes until alarm is acknowledged or cleared.	Low Run time Warning (short-long-short beep)	Warning when there is less than 3 minutes of back-up time remaining.
Fault "⚠" LED flashes until alarm is acknowledged or cleared.	Low Battery Warning/Shutdown (short-long-long beep)	Occurs within 1 minute of UPS shutdown. Could also indicate a faulty battery charger.
Fault "⚠" LED flashes until alarm is acknowledged or problem is corrected.	High Battery Warning (short-short-short-long beep)	There is a problem with the battery system.
Fault "⚠" LED and Charge "🔋" LED flashes until alarm is acknowledged or problem is corrected.	Charger Problem Warning (long-short-long-short beep)	The battery system may not be plugged into an AC source or there is a charger problem.
Fault "⚠" LED Battery Fail "✉" LED flashes until alarm is acknowledged or cleared.	Battery/Inverter Test Failure (long-short-short-short beep)	Indicates failed battery/inverter test performed every 28 days. Clear fault and recharge battery for 8 hours. Manually initiate test again. If fault recurs, call for service.
Fault "⚠" LED flashes until alarm is acknowledged or cleared.	Output Voltage Low (on inverter, short-long-short-short beep)	Output shuts down to protect load from low voltage.
Fault "⚠" LED flashes until alarm is acknowledged or cleared.	Output Voltage High (on inverter, short-short-short-short beep)	Output shuts down to protect load from high voltage.
Fault "⚠" LED and Overload "⚠" LED flashes until alarm is acknowledged or problem corrected, flashes when shutdown is imminent, and solid if warning only.	Output Overload Warning/Shutdown (long-long-long beep)	Flashes when load exceeds 105%, solid when overload is 101-105%, automatically clears when load is reduced.



5. Performance & Product Specifications

Table 5a. Esprit Models 3 and 4 Rack UPS Specifications

Item	Specification	Comment
Output VA	2880/4000	
Output W	2016/3150	
Surge protection, joule rating	420 joules per system	Each battery cabinet adds 210 joules
Waveform	Stepped approximation of sine wave	Pseudo-sine wave on back-up only
Nominal input voltage	120 VAC (opt. 100 or 127 VAC)	+10%, -15%
Maximum input voltage (VAC)	140	
Low voltage transfer (VAC)	102	Adjustable to 96
Low line return (VAC)	109	Adjustable to 99
High line transfer (VAC)	132	
High line return (VAC)	126	
Input current (A)	24/33 maximum	
Input frequency (HZ)	50 or 60 + or - 2.5 HZ	Auto-select at start-up
Input protection	Customer provided, branch	
Transfer time	4-8 ms.	To or from battery
Overload protection, line mode	Output disabled at >120% load	
Overload protection, battery mode	Output disabled at >120% load	
Efficiency, on utility	>98%	
Efficiency, on battery	>93%	
Battery mode voltage	120 VAC + or - 5% (120 VAC mode)	
Battery life expectancy	3-5 years	
Output frequency regulation	Nominal + or - 0.5 HZ	On battery
Battery mode output protection	Electronic current limit	Self-protected
Battery	12 each 5 Ah	144 VDC nominal bus
Maximum charge current	0.7 A	With 100% discharge
Float voltage	2.25 VDC/cell (162 VDC)	
Backup time	5 minutes	100% load
Battery protection	Current limiting fuses	1 internal, 1 w/extended battery
Recharge time	8 hrs.. to 90%, 4 hrs.. to 80%	Full discharge
Battery charger ripple current	0.05C maximum	
Low battery alarm level	1.75 v/cell, no load (126 VDC)	
Low battery shutdown level	1.65 v/cell, full load (119 VDC)	
Faulty battery alarm level	1.8 v/cell (130 VDC)	
Low battery alarm level	3 minutes before end of discharge	
Charger protection	Overload, current protected	
Max. # of extended batteries	Unlimited	
Controls	Start, stop, alarm reset switches	
Communications	RS232 or USB + two contact closures included	HID on RS232 or USB (selectable RS232 or USB)
Temperature	0-40 C	
Air flow	30 CFM on battery	Heat: ESP030 40-141W
Humidity	0-95% non-condensing	Heat: ESP040 60-211W
Noise	45 dBA maximum	

Table 5a. Esprit Models 3 and 4 Rack UPS Specifications (Continued)

Item	Specification	Comment
Design standards	Safety; UL, cUL 1778, Emissions; FCC A, Surge protection; ANSI C62.41, Transportation; (drop test), IEC 68 level 1, (vibration), IEC 68.2-6 level 3, testing; PowerCet tested	
Input connection	NEMA 5-30/50 w/ six foot cord	
Output connections	1 NEMA 5 30/50 and 4 5-15	
Auxiliary DC input	1 each special female connector on UPS (18" cord and male connector on optional battery)	Provides additional battery time
Size	1 each (UPS, battery)	5.25" X 7.25" X 19"
Weight	65/70 lbs.. total	
MTBF	200K hours	

Sizing Guide and Battery Runtimes (In minutes, 0.62 PF)

Unix Server		1 server		2 servers		3 servers		4 servers
PC Server	1 server	2 servers	3 servers	4 servers	5 servers	6 servers	7 servers	8 servers
VA	500	1000	1500	2000	2500	3000	3500	4000
Esprit 3 SLR	90	40	28	19	11	6		
Esprit 3 SLR + 1 Ext. Batt.	240	90	40	28	19	15		
Esprit 3 SLR + 2 Ext. Batt.	360	150	90	60	45	38		
Esprit 4 SLR	120	50	30	20	15	12	9	7
Esprit 4 SLR + 1 Ext. Batt.	240	100	72	45	35	28	24	18
Esprit 4 SLR + 2 Ext. Batt.	360	180	110	75	55	45	35	29

Extended Battery Runtime (internal plus extended battery, in minutes, 0.7 PF)

Extended Batteries (Qty.)	1	2	3	4
Model				
Esprit 3	12	30	45	60
Esprit 4	15	25	38	49

Note: All battery times above are typical.

6. Advanced Configuration

Esprit Front Panel Configuration Mode Usage and Instructions For advanced users only!

The Esprit UPS is shipped from the factory with a configuration that is suitable for most applications. However, there are some circumstances where modification of the UPS operating parameters is required. A special configuration mode, accessible from the front panel, has been provided for this purpose. This section of the manual describes how to use the front panel configuration mode and describes the UPS parameters that can be changed by the user.

Caution: Configuration mode can only be entered when the Esprit is operating on utility power. Attempts to enter configuration mode when the UPS is operating on battery power will be ignored.

Caution: When the Esprit is in configuration mode, transfers to battery power are inhibited. The load connected to the UPS will not be protected while the Esprit is in this mode. Normal UPS operation will resume upon exit from configuration mode.

6A. Entering/Exiting Configuration Mode

The Esprit front panel configuration mode is entered by simultaneously depressing the top (Alarm silence) and bottom (Power OFF) buttons for approximately 1-2 seconds. The Esprit will acknowledge entry into configuration mode by sounding the buzzer and slowly flashing the AC PRESENT indicator. The AC PRESENT indicator blinks slowly during the time that the Esprit is in configuration mode.

To exit configuration mode, press and hold both top and bottom buttons again. The AC PRESENT indicator will stop flashing, and the remaining indicators will resume their normal function. Any changes to the Esprit configuration made by the user will be permanently saved.

The Esprit incorporates a timer that automatically terminates configuration mode if no activity is detected for 30 seconds. This feature prevents the unit from remaining in the vulnerable offline state for a long period if the configuration mode is accidentally entered.

6B. Using Configuration Mode

When configuration mode is activated, the usage of the front panel status indicators changes. The top 4 indicators (GENERAL FAULT, BATTERY FAULT, BATTERY CHARGING, and OVERLOAD) are now used to indicate the internal feature being viewed or modified. The AC PRESENT indicator blinks slowly to indicate that the Esprit is in configuration mode. The bottom-most ON BATTERY indicator shows the state (on/enabled or off/disabled) of the currently active feature.

In configuration mode, the topmost button (Alarm silence) is used to advance to the next configuration setting. The top 4 indicators, which light in unique patterns to indicate which option is being viewed/modified, cycle forward each time the top button is pressed. The bottom button (power off) is used to toggle the current option ON or OFF. The ON BATTERY indicator toggles on and off each time the bottom button is pressed.

It is possible to cycle backward through the configuration options by pressing and holding the top button. A given option setting can be forced to its factory default state by pressing and holding the bottom button.

The middle (Power ON) button is not used in configuration mode.

To leave configuration mode, simultaneously depress and hold in both the top and bottom buttons until the buzzer sounds and the AC PRESENT indicator stops flashing. Any changes made to the Esprit configuration will now be permanently saved.

6C. Configuration Options

The table below lists the options that can be changed by the user in configuration mode, and shows which front panel indicators will be on for each option.

Option Number	Indicators				Option affected
	Fault	Batt Fail	Charge	Overload	
0	—	—	—	—	Extended Battery switch A
1	*	—	—	—	Extended Battery switch B
2	—	*	—	—	Extended Battery switch C
3	*	*	—	—	Operating voltage switch A
4	—	—	*	—	Operating voltage switch B
5	*	—	*	—	Input voltage tolerance switch A
6	—	*	*	—	Input voltage tolerance switch B
7	*	*	*	—	Test alarm
8	—	—	—	*	Limit run time on battery power
9	*	—	—	*	Cold start enable
10	—	*	—	*	Auto restart after low battery shutdown
11	*	*	—	*	UPS mode (On=Normal, Off=Line condition)
12	—	—	*	*	Automatic frequency detect on powerup
13	*	—	*	*	Operating frequency (0=50 Hz, 1=60 Hz)
14	—	*	*	*	Comm port mode (0=Normal, 1=Tuning/factory)
15	*	*	*	*	Power-on inverter test

Indicators: (*) = Option On/illuminated, (—) = Option Off/dark

Options 0, 1, 2 – Extended Battery Configuration

These three option switches should be changed as shown in the table below when new battery cabinet(s) are added to the UPS. The standard setting for these options are all OFF, selecting the single/internal battery module option.

Option Setting			Number of battery cabinets installed
0 (A)	1 (B)	2 (C)	Esprit 3 & 4 (SlimLine)
—	—	—	Internal only
*	—	—	1
—	*	—	2
*	*	—	3
—	—	*	4
*	—	*	5
—	*	*	6
*	*	*	7

Indicators: (*) = Option On/illuminated (—) = Option Off/dark

Options 3, 4 – Operating voltage selection

These two options select the nominal operating voltage of the UPS as shown in the table below. The factory setting is 3=Off, 4=Off, which configures the Esprit for 120V (230V) operation.

Switch Setting		Nominal Operating Voltage
3 (A)	4 (B)	Low Voltage
—	—	120 V
*	—	100 V
—	*	127 V
*	*	Custom

Indicators: (*) = Option On/illuminated (—) = Option Off/dark

Do not select the "Custom" setting (Option 3 & 4 both ON) unless you are instructed to do so by MGE service.

Options 5, 6 – Input Voltage Tolerance

Use these two option switches to select the Esprit's sensitivity to low/high input voltage conditions. The Esprit will switch to battery power when the utility voltage falls outside the range selected. The percentages shown in the table below are subtracted/added to the nominal voltage setting as set by options 4, 5. The factory setting is 5=OFF, 6=OFF which selects the –15/+10% range.

Switch Setting		Input Voltage Tolerance	
5 (A)	**6 (B)**	**Low limit**	**High limit**
—	—	- 15%	+ 10%
*	—	- 20%	+ 15%
—	*	- 10%	+ 10%
*	*	Custom	

Indicators: (*) = Option On/illuminated (—) = Option Off/dark

Do not select the "Custom" setting (Option 5 & 6 both ON) unless you are instructed to do so by MGE service.

Option 7 – Test Alarm

The normal state of this option is OFF. Turning it on will instruct the Esprit to issue a "User Test Fault". This condition does NOT affect the UPS operation in any way, but it does close the Low Battery contact on the DB9 communication port, and activates the FAULT indicator and audible alarm (pattern short-short-long). You can use this option switch to test hardware connected to the Low Battery contact without actually running the Esprit battery down.

To clear the User Test Fault, set this option to OFF, or follow the "Alarm Clear" procedure. Press and hold the top button.

Option 8 – Limit run time on battery power

The normal setting for this option is OFF, which allows the UPS to operate on battery for the maximum time possible. The Esprit run time on battery is limited only by the capacity of it's battery system and the battery state of charge.

If Option 8 is turned on, the Esprit will run a maximum of 15 minutes on battery power before turning itself off. Actual run time may be less, depending on size of battery system and load.

Option 9 – Cold Start (allow UPS to run on battery power on startup)

When Option 9 is turned ON (factory setting), the UPS is allowed to start up on battery power if the AC input voltage is not present or not of satisfactory quality. The ability to run on battery power immediately upon startup is known as "cold start" capability.

If this option is turned OFF, the UPS will start up with its output OFF if input AC is not present or usable. The output will not be turned on until input AC is present and usable. Once the UPS turns on it's output, a subsequent loss/disturbance of input AC will cause the UPS to run on battery power as usual.

Option 10 – Automatic UPS restart after Low Battery shutdown

The factory setting for this option is ON, which allows the UPS to automatically turn its output back on following a Low Battery shutdown once input AC is present. This setting is the usual one for applications where the UPS is connected to automated or unattended equipment that is capable of restarting itself without direct human intervention.

If the load connected to the UPS requires special attention when it is powered up, this option should be turned OFF. When Auto Restart is turned off, the UPS output will stay turned off until it is manually restarted by pressing and holding the top silence/restart button on the front panel.

Option 11 – Automatic UPS mode

The default setting for Option 11 is ON, which allows the Esprit to act like a typical UPS. The UPS will automatically switch from utility to backup power as needed.

If this option is turned off, the Esprit acts like a line conditioner. The battery backup system is disabled. If the input utility power is acceptable, the Esprit will pass it through to the load. If the input power is unacceptably low or high, the load power is removed. The Esprit will NOT operate on battery power if Option 11 is turned off!

Option 12 – Automatic Frequency Detect

When this option is set the factory default ON setting, the Esprit will analyze the input power when it is turned on, and configure itself to operate at the proper frequency (50 or 60 Hz). If utility power is not present when the Esprit is turned on, it will configure itself based on the frequency setting in place when the unit was last turned off (see option 13 setting).

If this option is turned OFF, the Esprit will configure itself to operate using a utility power frequency set by Option 13. Power-up input AC frequency analysis is not performed.

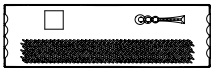
Option 13 – Operating Frequency selection

This option setting is only effective if Option 12, Automatic Frequency Detect is turned off. If Option 12 is turned off, this option (13) setting can be used to select the Esprit's nominal operating frequency. If this option is OFF, 50 Hz operation is selected. If ON, 60 Hz operation is selected.

The factory setting for this option is ON, selecting 60 Hz operation at startup. Note, however, that the setting of this option is overwritten by the UPS logic if option 12 (Automatic Frequency Detect) is enabled. If the Esprit is powered up from a 50 Hz source with option 12 enabled, the setting of this option (13) will be forced to OFF.

Option 14 – Communication Mode Selection

This option should be left in it's factory-standard OFF setting unless you are instructed to turn it ON by MGE Service. If this option is inadvertently turned ON, the Esprit may be rendered incapable of operating with UPS monitoring and control software, including MGE's Solution-Pac software.



Option 15 – Power-On Inverter Test (POIT)

When this option is set to the factory default ON setting, the Esprit will perform a short battery/inverter test shortly after it is turned on. This test is only performed only if the UPS is able to power up the load from utility power first. If the POIT is enabled, the UPS will power up the load from utility power, then briefly switch to battery power approximately 5-7 seconds after it is powered up. The UPS runs on battery for only 3-5 seconds, so no significant drain on the battery will occur.

The POIT is disabled if this option is turned OFF. The setting of this option has no effect on the scheduling and execution of the monthly inverter/battery test, which runs less frequently than the POIT but is considerably more exhaustive.

7. Service & Maintenance

7A. Maintenance

Clean the UPS with a dry cloth after turning off all power to the UPS and switching off the power switch.

The UPS performs monthly automatic battery tests. However, it is recommended that a 6 month test be performed on the UPS for battery condition. Perform all tests off peak hours with applications shut down.

1. Turn off power to the UPS via the branch circuit breaker to the UPS. It is not recommended to disconnect the plug from the UPS to the utility power due to disconnection of the safety ground.
2. Allow the UPS to run on battery power for 1 minute. Monitor the UPS for any fault LEDs and if none are observed, return power to UPS and log results below in the maintenance log. If battery fault LED is lit, call for service.

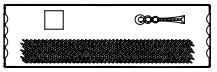
Maintenance Log

UPS serial number	Date of installation	Location	Notes

	Date	Check ✓	Comments
6th month			
12th month			
18th month			
24th month			
30th month			
36th month			
42nd month			
48th month			
54th month			
60th month			

Places to Contact for Service and Questions

In USA or Canada, call **1-800-438-7373** M - F 24 hours. For service outside USA or Canada, call your local distributor. You may also visit our web site at: **www.mgeups.com**



7B. Recycling Your UPS

In USA or Canada, call **1-714-557-1636,** M - F, 6:00 A.M. to 5:00 P.M. PST. Ask for a return goods authorization for free UPS or battery recycling. MGE does not cover return freight charges for recycling and will not accept items without a return goods authorization number.

8. Troubleshooting 

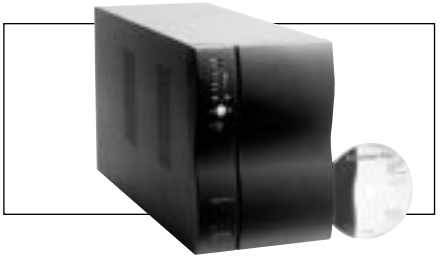
Problem	Possible cause	Required User Action
◗ UPS does not turn on.	◗ UPS is not plugged in. ◗ Wall socket is dead. ◗ UPS has not been activated.	◗ Plug UPS into a working outlet. ◗ Test wall socket, repair as required. ◗ Press Output ON (1) button for one second, then release.
◗ There is no power to the computer load.	◗ Confirm that the UPS is on. ◗ Output circuit breaker is tripped. ◗ Load plugs are not seated properly.	◗ See above. ◗ Disconnect load and check. If okay, reset circuit breaker. ◗ Remove and reseat plugs.
◗ Battery Online indicator remains on, even though line voltage is present.	◗ Utility line is out of specification.	◗ Test wall socket, repair as required.
◗ UPS beeps occasionally.	◗ UPS is on battery.	◗ None - UPS is protecting your system.
◗ UPS does not provide the expected backup time.	◗ Battery capacity is low. ◗ Protected equipment power requirements exceed UPS capacity.	◗ Allow battery to charge for 24 hours, then retest. ◗ Reduce load, then retest.
◗ Overload indicator flashes.	◗ Protected equipment power requirements exceed UPS capacity.	◗ Reduce the load.
◗ Battery Fault indicator is lit.	◗ Battery is weak or charger is faulty.	◗ Make sure battery is connected. If battery is properly connected, allow the battery to charge for 24 hours. Retest. Have batteries replaced if condition persists. Make sure battery charger is plugged into a functioning outlet.

Notes

Other Fine MGE Products

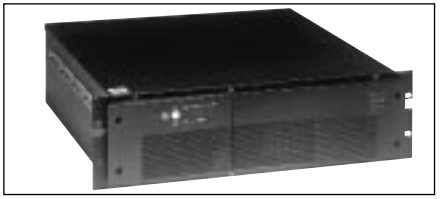
Eclipse Surge Suppressors

Ellipse
300-1200 VA



ESV+ UPS
780-2200 VA

ESV+ Rack UPS
780-2200 VA



EX UPS
700-3000 VA

EX Rack UPS
700-3000 VA

Esprit UPS
3 - 13.5 kVA

Call MGE for many more power solutions:
(714) 557-1636 or (800) 523-0142

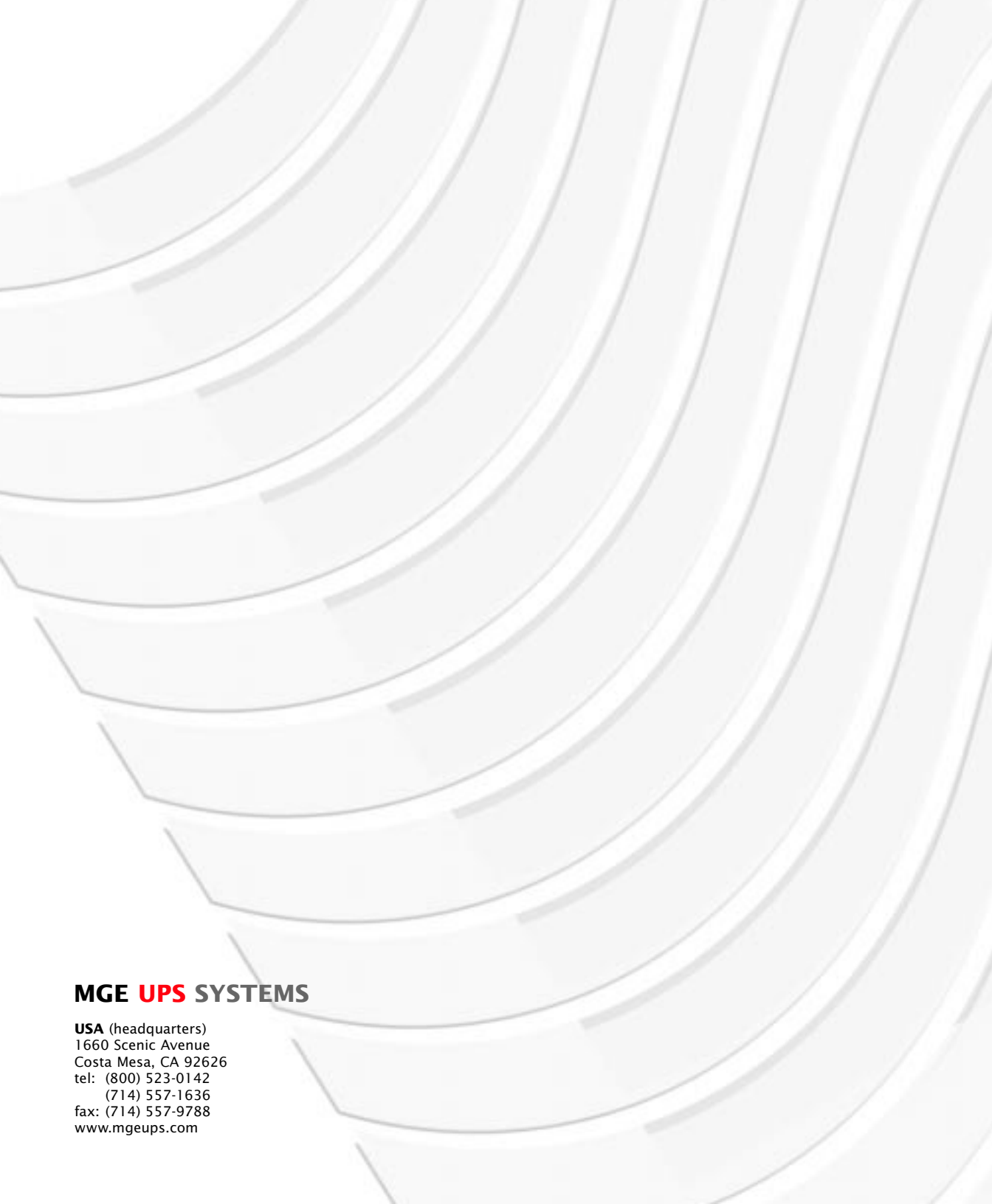
Designed for Microsoft Windows 2000 Professional Windows NT Workstation 4.0 Windows 98

Novell

MGE GREEN SWEEP
Call MGE to return your UPS for free recycling to a US EPA-certified recycling center and help protect our environment.

c UL us

ISO 9001



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